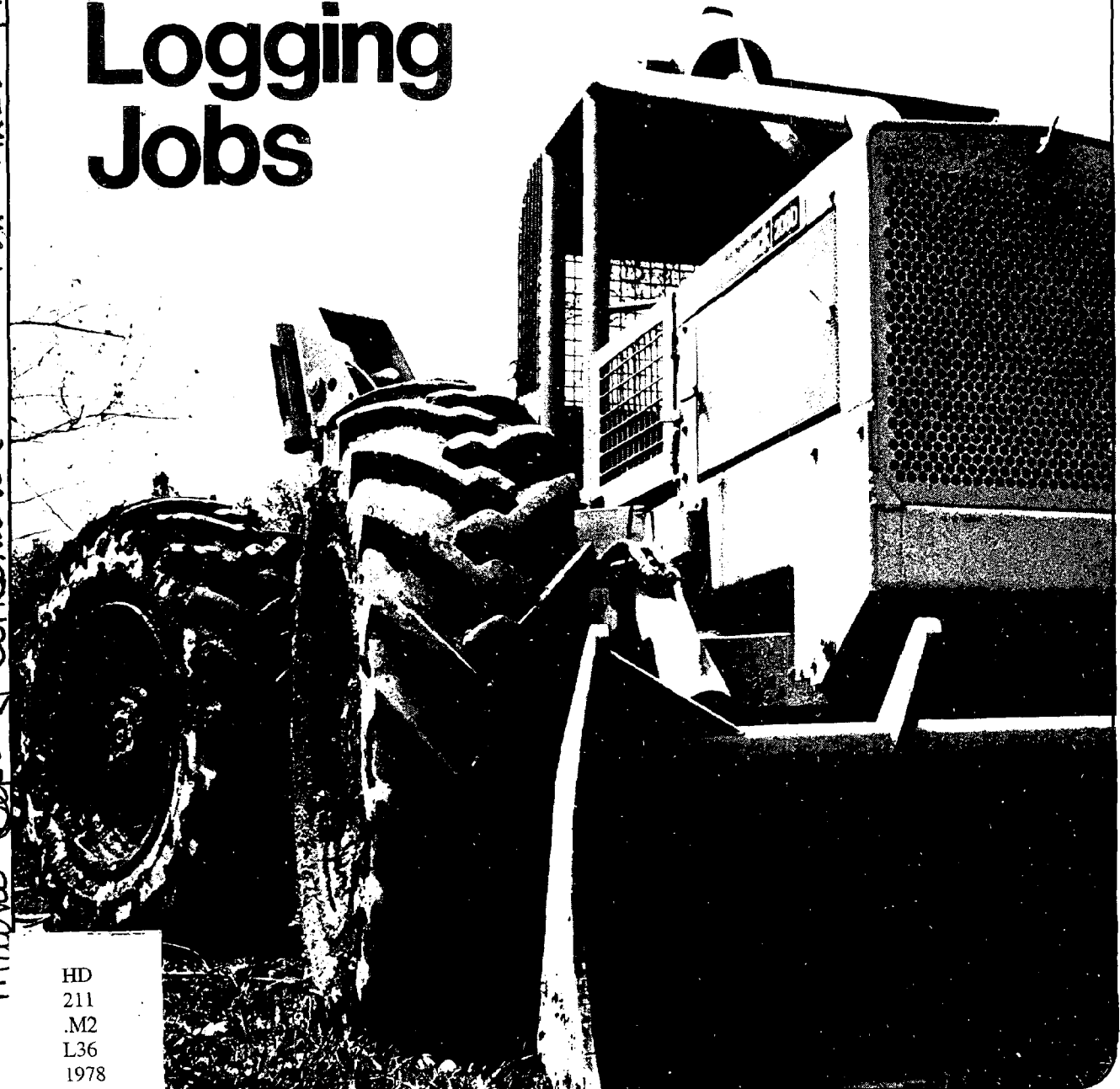


THE LAND USE
HANDBOOK
Section

6

CZIC COLLECTION

Erosion Control on Logging Jobs



HD
211
.M2
L36
1978
pt.6

ITMENT OF CONSERVATION

LAND USE REGULATION COMMISSION

HD211.M2L36 1978 pt.6
Maine Dept. of Conservation

This Manual was financed in part by the National Endowment for The Arts. The views expressed, however, do not necessarily represent the views of the Endowment.

November 1978

Reproduction or resale of any part of this booklet for commercial purposes requires written permission from the Department of Conservation, State House, Augusta, Maine 04333.

Printed under appropriation number 1509-1001.

13739



Erosion Control on Logging Jobs

Table of Contents

Introduction	2
Why prevent erosion on logging jobs?	3
How to plan for skidding, yarding and hauling	5
How to lay out temporary roads	8
Skid trails on slopes	9
Erosion control devices	10
Culverts	11
Open top culverts	13
Broad based drainage dips	15
Humps in skid roads and trails	16
Water bars	17
Out-sloping	19
Slash in skid roads and trails	20
Log bridges	21
Seeding	23
Logging and the law	24
L.U.R.C.'s General Notification procedure	26
More information	27

Introduction



Erosion control on logging jobs

Section 6 of the Land Use Handbook describes how to minimize erosion on logging jobs. This Section is written for the small woodlot owner. It explains how to plan and lay out skid and truck roads and how to construct devices in the roads to avoid erosion problems. The Section concludes with a short description of laws that woodlot owners, operators and contractors should know about before they begin a harvest operation.

Most of the procedures described in this booklet are suggestions; some are required by law. However, any erosion that goes unchecked will cost lost time and money over the long term. In short, good logging practices and erosion prevention measures pay.

Definitions

Because some logging terms mean different things to different people, the following definitions describe how a few key words are used in this booklet:

Skid trail - a route used by skidders that is not laid out ahead of time and that does not result in much disturbance of the ground surface.

Skid road - a route used frequently by skidders, that may be laid out ahead of time and that may be bulldozed with a tractor or skidder, to level out rough spots where large areas of soil are exposed.

Truck road - a route, constructed to give (Haul Road) trucks access to yards or landings, which is not a year-round through route; a truck road may be gravelled or ungravelled but requires some shaping, such as cut and fill, ditching, culverts...etc. Truck routes as described here are in use for a relatively short period and then abandoned.

Yards - areas to which wood is hauled (or landings) by skidder (twitched) for storage before transfer to trucks.

Slopes - grades, slopes or the steepness of roads and hillsides are referred to in percentages. For example: "a 10% slope..." This means a rise of 1 foot in 10 feet or 10 feet in 100 feet.

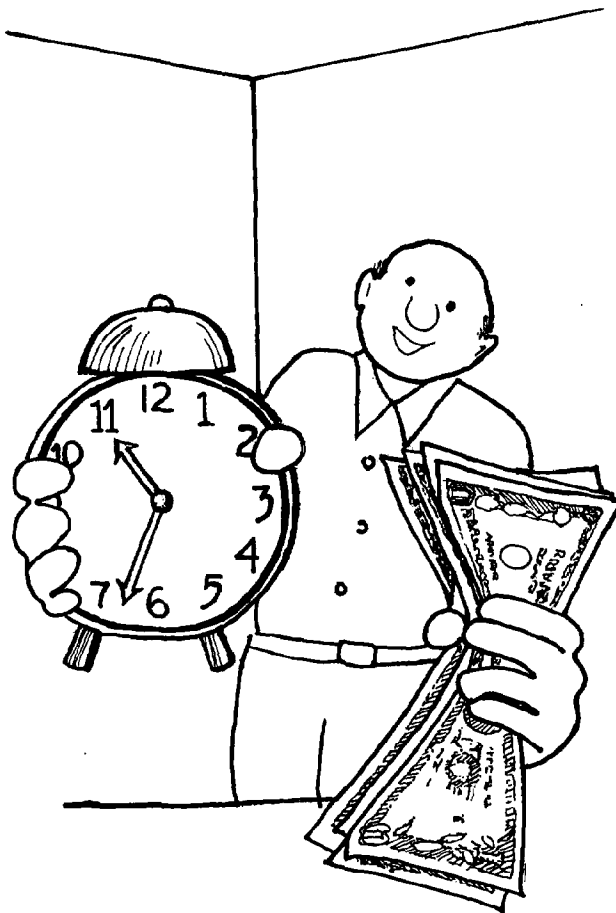
Why prevent erosion on logging jobs?

Erosion prevention pays

This Section describes how to plan truck and skid roads and how to improve these types of roads with culverts, dips, humps, and other devices. The obvious question is "why?" Why reduce erosion? The answer is straightforward—good planning and careful management of the forest resource pays off over the long term.

If you plan ahead of time and build roads that have erosion control devices in them, you end up with:

- a road system that works well
- fewer road maintenance costs
- less wear on your equipment
- faster skidding and hauling operations
- fewer production delays caused by wet weather and washouts
- better overall production
- truck roads that you can reuse and
- clean streams



Poor logging practices cause excessive soil erosion

Research has shown that over 90% of the sediment reaching streams in woodland areas comes from logging roads and trails. In fact up to 20% of the land area in a cut may consist of roads, trails and landings that are susceptible to erosion. In addition, logging on steep slopes that have loosely packed soils, or building roads in areas with many streams, or working a site during the spring runoff season can cause excessive erosion.



Good water management is the key to erosion control

When the top soil on the forest floor is torn up and roads and trails are constructed the natural filtering action of the soil is destroyed. Trucks and skidders then compact the underlying soil. When it rains or the snow melts, surface water is not absorbed. Instead, the surface water flows into the roads and trails; they act as man-made streams that increase in speed and volume as they flow downhill; as the water flows it tears away the soil and destroys your work.

Water control helps prevent erosion. Water control can be achieved by laying out the roads and trails correctly and by finding ways to get the water off the roads and trails as quickly as possible, before erosion can occur. Careless construction leads to rebuilding, lost time, and higher costs.

If ditches, cross-drains, culverts, or other devices are not provided on a road that cuts across a slope, the road will collect uphill runoff and channel the water down the road-bed, eroding the road as it flows.

Alternatives to a skidder

This booklet describes many procedures to control erosion on skid roads. Of course there are alternatives to using a skidder. A number of individuals still log using horses, while others use small bulldozers. Although less productive, using animals or a dozer reduces the possibility of erosion.

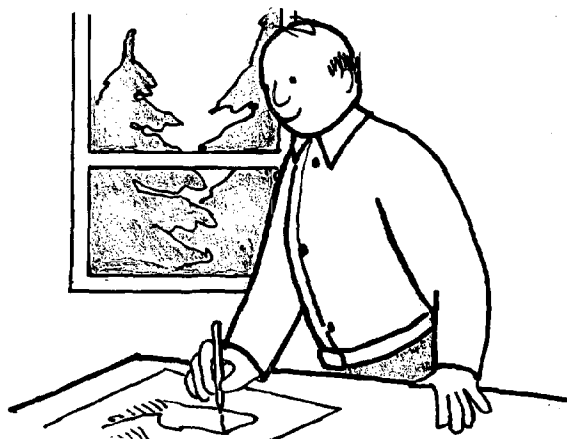


How to plan for skidding, yarding and hauling

Good logging begins with good planning

Plan to lay out your truck road, landings and main skid roads on paper first, before you can make any expensive mistakes on the ground.

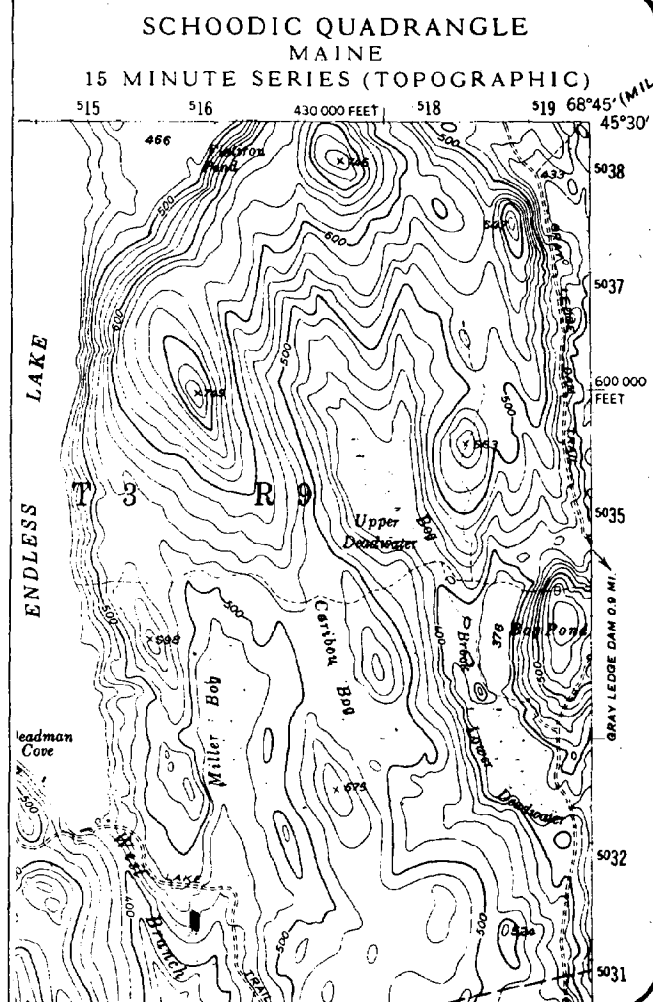
A few hours of good planning can save days of road building or skidding time.



How to design a good road layout

Follow these steps to obtain the best road layout for your land:

1. Mark the boundaries of the area you plan to cut. Use a U.S. Geological Survey (U.S.G.S.) map for this. The maps are available from most sports stores.
2. Walk the area so you know the lay of the land and where the best stands for cutting are located. (You may also wish to use a forest type map and aerial photo.)
3. Outline areas on the topographical map that are: within 250 feet of a stream, pond or lake; very steep; wet; or do not have operable timber. Make yourself familiar with any Shoreland Zoning or L.U.R.C. regulations that might apply in these areas. (See pages 24 through 26 for details on regulations that might apply to your harvesting operation.)
4. Using the guidelines listed on page 6, draw different truck and skid road plans on the map. Draw your plans on tracing paper and then compare the different plans to see which gives you the best layout. See the example on page 7.



Guidelines for laying out truck roads, landings and skid roads

Locate your roads so that they give easy access to the timber you wish to cut, and wherever possible adhere to the following guidelines:

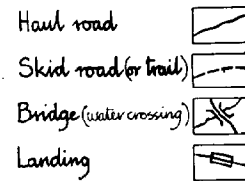
- keep stream crossings to a minimum
- cross streams by the most direct route, preferably at right angles to the stream
- put truck roads on high ground with easy grades
- avoid long, steep grades and sharp bends
- keep roads out of wet spots and off the tops and toes of banks and slopes
- locate landings on flat or gently sloping ground with good drainage
- set landings back at least 250 feet from streams, ponds, lakes and marshes
- do not locate skid roads in or near stream channels
- keep skid distances reasonable, from 1/8 to 1/2 a mile and
- if you have the choice, plan to build your roads during dry periods, and cut when the ground is frozen.

The photograph shows a winter operation. Snow, frozen ground and slash in the road help to assure that the skid road will not cause erosion problems.



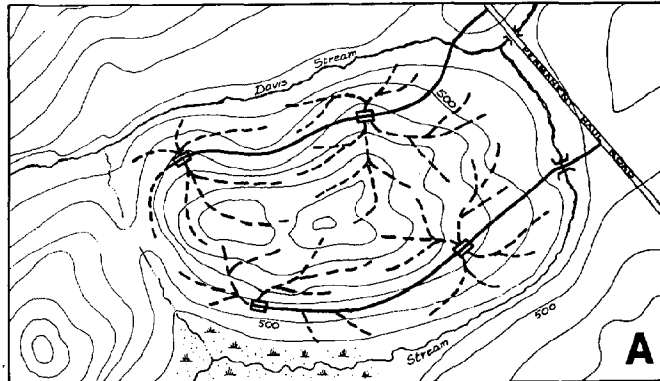
How to select the best road layout—an example

Plans A, B and C show three ways to place truck and skid roads on a cutting unit. The comments next to each plan indicate why Plan C is best.



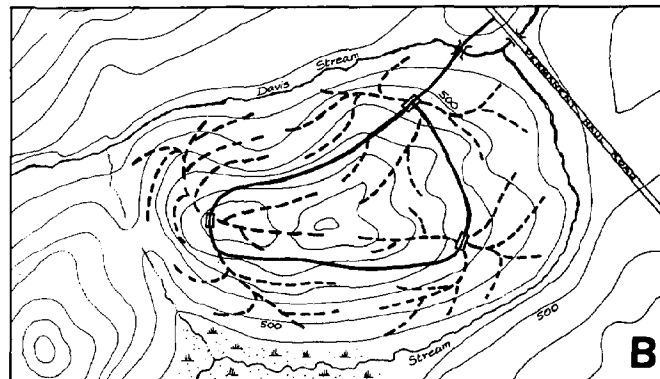
Plan A layout: 2 bridges
4 landings
3 miles of haul road

- Comment:**
- Road and bridge construction costs too high.
 - Skid distances too short
 - Too much steep downhill skidding
 - Too many landings on too steep land
 - Two bridges are unnecessary.



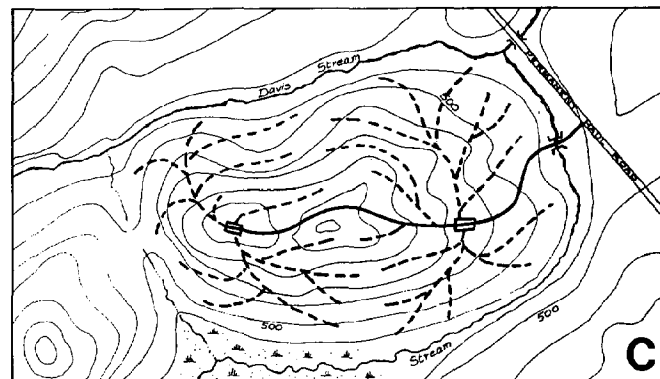
Plan B layout: 1 bridge
3 landings
3.5 miles of haul road

- Comment:**
- Loop road unnecessary
 - Skid distances too short
 - Erosion minimized by uphill skidding.

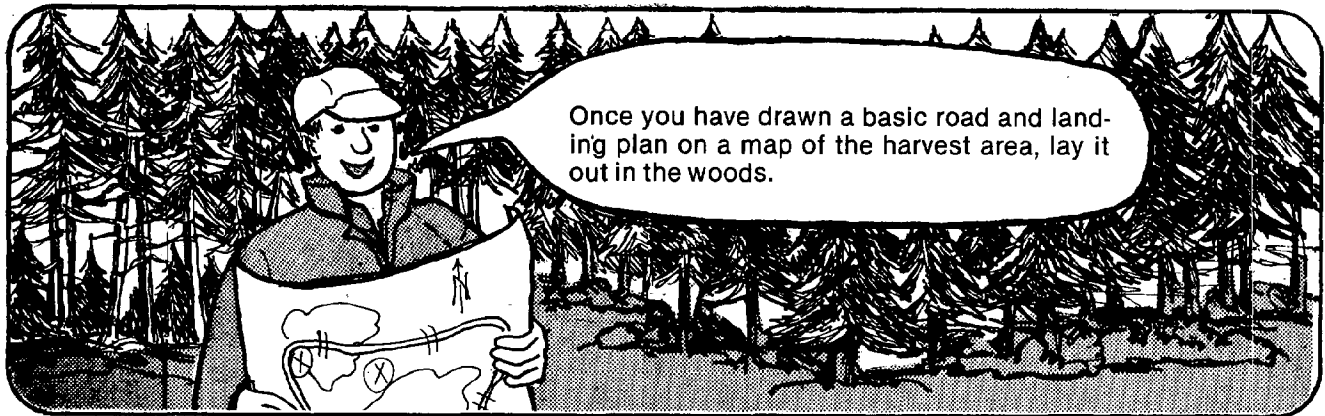


Plan C layout: 1 bridge
2 landings
2 miles of haul road

- Comment:**
- Haul road follows high ground
 - Minimal road construction
 - Ideal skidding distances
 - Erosion minimized by uphill skidding
 - Least number of landings
 - Only one bridge required.



How to lay out temporary roads



Follow these 3 steps to lay out temporary truck roads in the woods

1. Establish some "control" points before you set off. These points could be where the road begins; ends; crosses a stream; follows a stream; follows a ridge...etc. These points should be places you can identify on a map and on the ground.
2. Walk the rough road location using the control points to guide you.
 - Flag this route (see photo) as you walk in and make a mental note of possible landing sites and possible, gravel pit areas.
 - Check skidding distances on both sides of this proposed route.
3. Walk back out following your flagged route.
 - Adjust your flagging to take advantage of natural features that will make road construction and drainage easier.
 - As you go, check the grades of the flagged route to make sure they are reasonable—up to 10% is best (10 foot rise for every 100 feet).
 - Mark areas suitable for landings and gravel pits.
 - Make sure the route makes the best stands readily accessible.



Skid trails on slopes

How to minimize erosion on skid trails on slopes

Minimize erosion and reduce the possibility of washouts and deep ruts by creating skid trails that **disperse** any surface water that collects in them, for example:

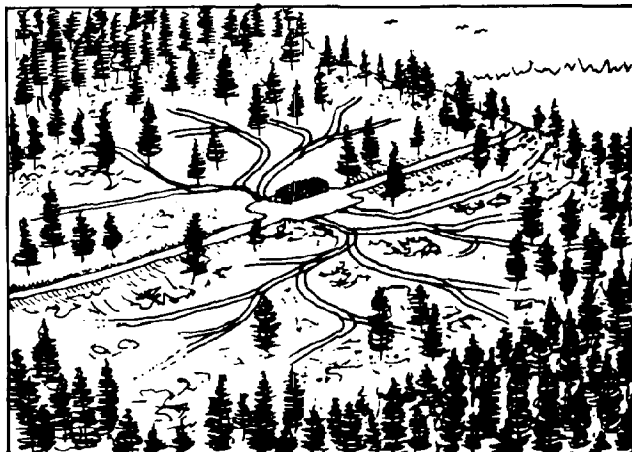
On gently sloping land

On land that slopes no more than 10% (10 feet rise for every 100 feet) skid **uphill** where possible so water running in the pattern of skid trails is dispersed (see photo) and not concentrated on the landing.



On steep slopes

On land that slopes more than 10%, avoid skidding straight downhill for any distance. Skid **across** the slope wherever possible.



On slopes near streams and lakes

On land near streams and lakes skid in an uphill direction away from the water's edge. Avoid locating the landings or truck roads near the water. Again, make trails that disperse the water and prevent it from flowing directly into a lake or stream. Remember that harvesting within 250 feet of most lakes or streams is usually subject to regulation (see pages 34 and 26).



Erosion control devices



Reduce erosion on truck and skid roads

The following pages (11 through 23) describe different devices and techniques that can be used to reduce erosion on truck and skid roads.

Different situations will require different solutions. In some cases a number of these devices will be needed to control erosion; in other cases a single culvert or water bar might be sufficient.

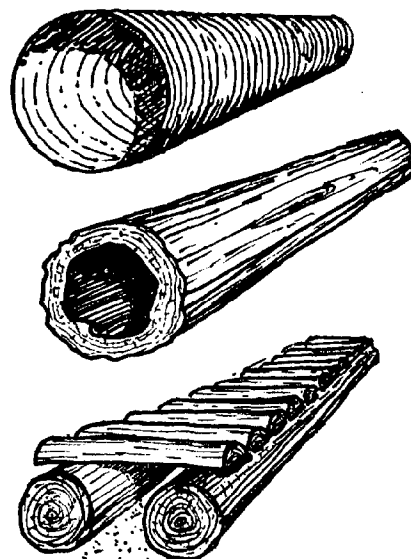
The text and illustrations that follow show you how to use and install culverts, dips, humps, bars and bridges. Use your judgment as to which will control erosion best on your site and on your roads.

Culverts

When can culverts be used?

Metal, hollow log, or wood culverts (see sketch) can be used under truck roads to catch surface water in side ditches and direct it away from the road ditch on to the forest floor. Use this type of cross drainage on long, sloping roads and at the top and bottom of short, steep sections of road.

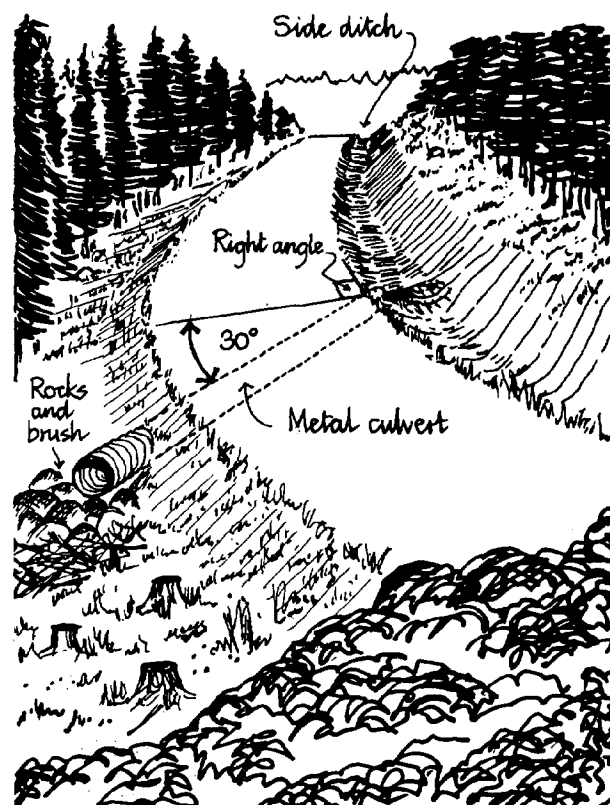
Metal or concrete pipe culverts can be used under truck or skid roads to convey a stream under a crossing. (See page 21 for a description of how to build a log bridge over a stream.) If you plan to install a culvert in a stream in the Land Use Regulation Commission's jurisdiction, you must notify them of your intent and meet their standards. (See pages 24, 25 and 26.)

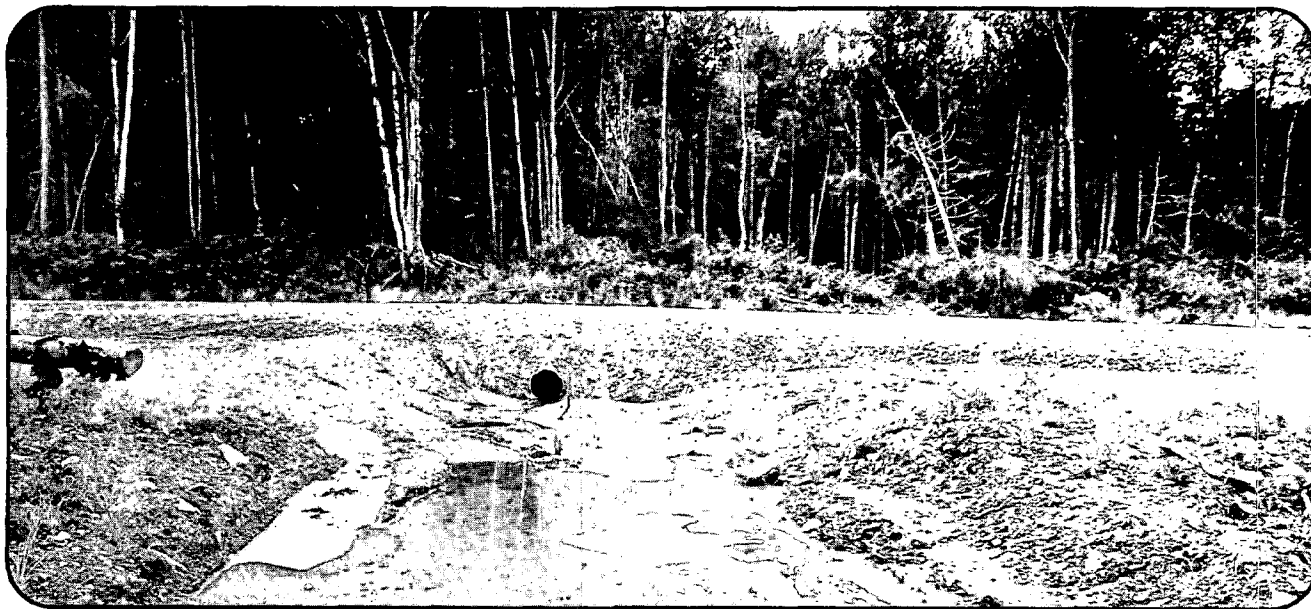


How to install a cross drainage culvert under a truck road

After you have cleared away trees and brush and shaped the haul road, determine where the cross drainage is needed and:

1. Install the culvert at a 30 degree angle downslope (see diagram).
2. Place the culvert about 12 inches below grade and allow it to slope at least 5 inches in every 10 feet.
3. Allow the inlet end to extend into the side ditch so that it intercepts water flowing in the ditch.
4. Allow the outlet end to extend beyond any fill and empty onto an apron of rocks, gravel, brush or logs.
5. Space the culverts according to the road grade:
 - On gentle slopes space them 150 feet apart.
 - On moderate slopes space them 100 feet apart.
 - On steep slopes space them 75 feet apart or less.





How to install a culvert in a stream bed

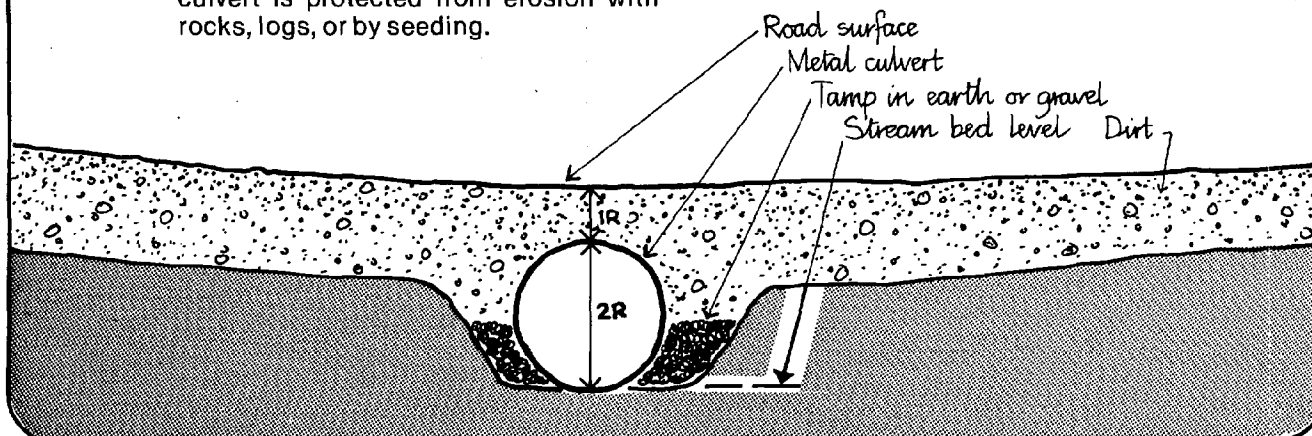
1. Locate your road and culvert so that the road crosses the stream channel at right angles; select a location that has firm banks and fairly level approaches.
2. Select a culvert that is large enough to handle at least a 10 year frequency storm* flow.
3. Install the culvert so that:
 - the bottom is at or a little below the stream bed
 - earth or gravel is tamped around at least half of the culvert for its full length
 - the dirt covering the culvert is as deep as half the culvert diameter (see sketch)
 - both ends extend a foot beyond the toe of the fill over the culverts and
 - the upstream end of the fill around the culvert is protected from erosion with rocks, logs, or by seeding.

Note:

If the road over the culvert is not used for 3 or more years, and the culvert is not large enough to handle a 25 year frequency storm*, the culvert should be removed. The stream banks should then be cleaned up, seeded, or otherwise stabilized.

*A 10 year or 25 year frequency storm refers to the worst storm that is likely to occur in any 10 year, or 25 year, period. The longer the frequency period, the larger the expected volume of storm water.

Culvert manufacturers can supply information on the capacities of different pipe diameters.

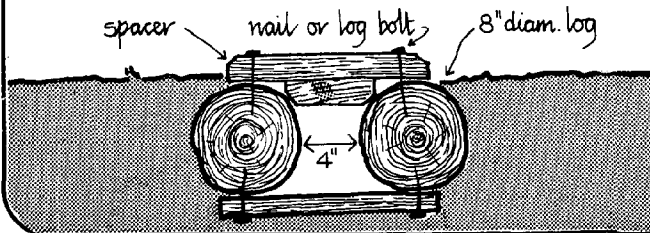


● Open top culverts

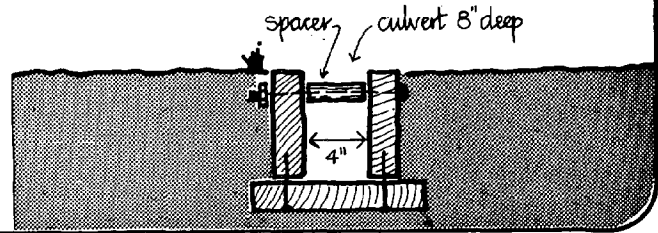
Open top pole and box culverts

Two types of open top culverts are commonly used:

Pole culvert



Box culvert



When to use open top culverts

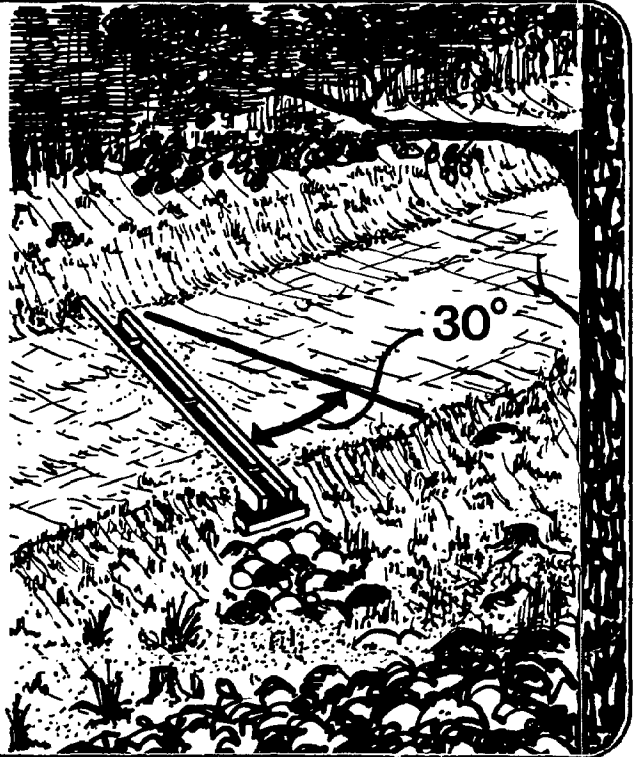
Use open top culverts on low-cost truck roads to drain side ditches or to divert surface water running on the road itself. Do not use open top culverts to handle streams that flow part of the year or on those that flow year round.

Open top culverts clog up easily so clean them regularly and do not use them on skid roads.



How to install an open top culvert

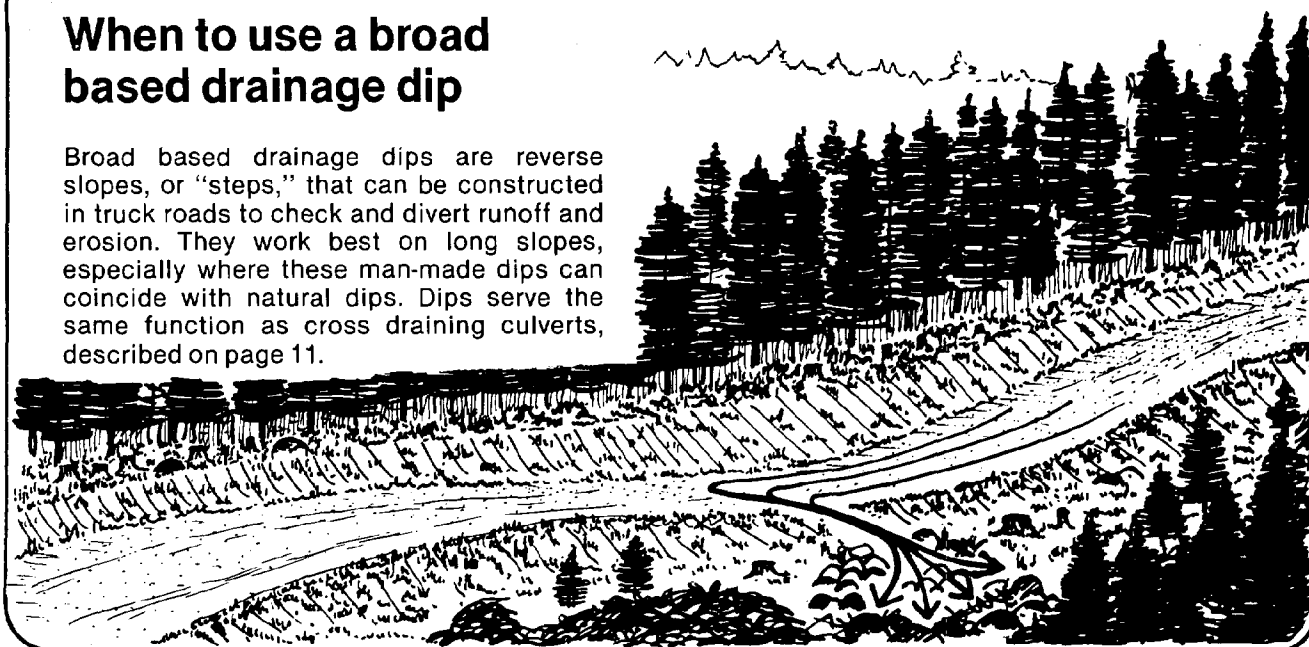
1. Install the culvert at a 30 degree angle downslope.
2. Let the open outlet end extend beyond the road surface and place a broad apron of rocks or logs under it to spread the flow of water and trap sediment.
3. Let the inlet end extend into the cut slope or ditch.
4. Space culverts on long slopes at regular intervals:
 - On gentle slopes space them about 150 feet apart.
 - On medium slopes space them about 100 feet apart.
 - On steep slopes space them about 75 feet apart, or less.



Broad based drainage dips

When to use a broad based drainage dip

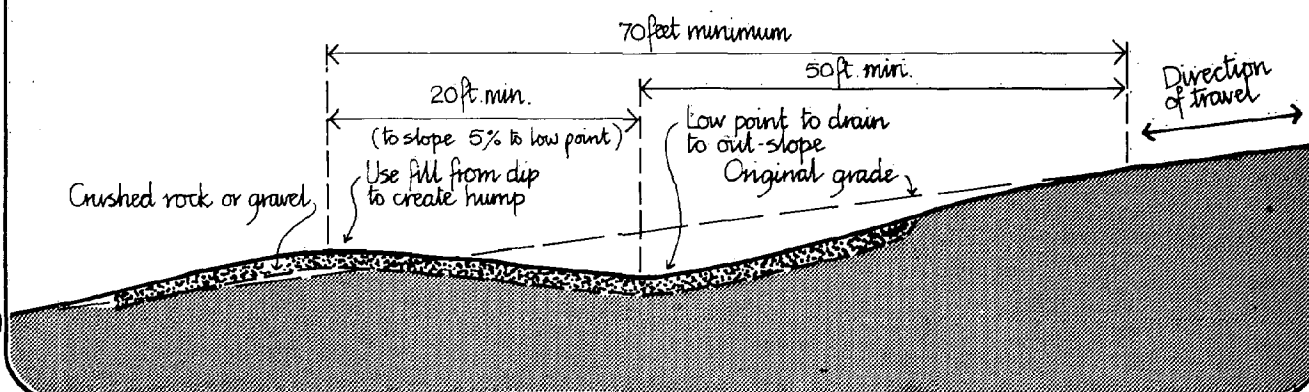
Broad based drainage dips are reverse slopes, or "steps," that can be constructed in truck roads to check and divert runoff and erosion. They work best on long slopes, especially where these man-made dips can coincide with natural dips. Dips serve the same function as cross draining culverts, described on page 11.



How to construct a broad based drainage dip

1. Construct the basic road bed first. (Dips should not be used on roads that slope more than 10%, one foot in ten.)
2. Excavate the dip so that the road slope is reversed. The base of the dip should drain to the out-slope. Follow the dimensions shown in the diagram below.
3. Gravel the surface of the dip as shown in the diagram.
4. Protect the discharge area with grass sod, brush, rocks or logs so as to reduce wash outs and catch sediment.
5. Space dips about 300 feet apart on gentle slopes, 160 feet apart on medium slopes and about 120 feet apart on steep slopes (slopes of about 10%).

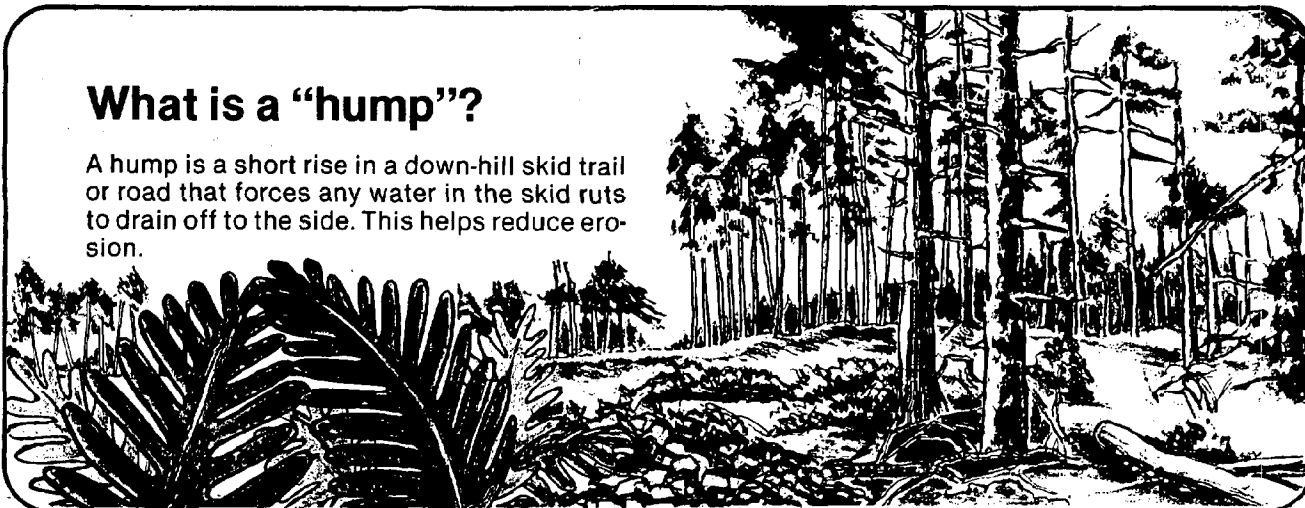
Section through drainage dip



Humps in skid roads and trails

What is a “hump”?

A hump is a short rise in a down-hill skid trail or road that forces any water in the skid ruts to drain off to the side. This helps reduce erosion.



How to make a hump

1. Swing the skidder uphill while making a downhill run, to create a small rise; any water in your tracks is then forced by the hump to flow off to the side. See the sketch below.
2. Use natural humps or rises in the landscape to create this effect where possible.
3. Space the humps according to the grade:
 - On gentle slopes space them 150 feet apart
 - On moderate slopes space them 100 feet apart
 - On steep slopes space them 75 feet apart.

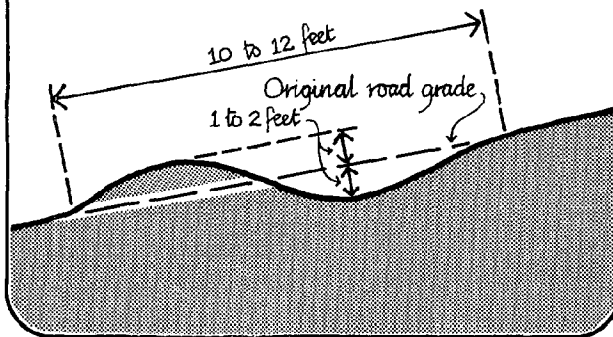


Water bars

What is a water bar or water break?

Water bars or breaks are small earth dams formed in the road to force water off the road, out of side ditches, and into the woods.

Section through water bar



Install water bars after operations are finished

Unlike dips (page 14) bars or breaks are installed after logging operations are done, or as a temporary measure after fall operations. This prevents road destruction during spring runoff.

When truck and skid roads are "put to bed," install water bars and remove all metal, concrete or wood culverts, or open-top culverts. Install water bars at the top and bottom of steep sections of roads as well. See the photograph on page 23.



How to install a water bar

1. Install bars with a skidder blade or dozer blade, or by hand.
2. Start work at the end of the road and skid trails and work back toward the yard and permanent truck haul road.
3. If recreation vehicles will use the road, use a log as a "core" for the bar.
4. Install the bar so it is at a 30 degree angle downslope. See the sketch at the bottom of page 17.
5. Extend the bar into the side ditch or cut slope, so it intercepts water there.
6. Extend the outlet end of the bar beyond the edge of the road and place rocks, slash or logs there to filter the water.
7. Construct the bar so it extends at least 12 inches above the road surface and 12 inches below the road surface.
8. Space the bars the same distance apart as open top culverts.

Out-sloping

Out-sloping helps minimize erosion

Out-sloping means cutting a road section so that it slopes slightly from the cut bank to the outside edge of the road bed. This allows water to flow across the road and not build up in it.

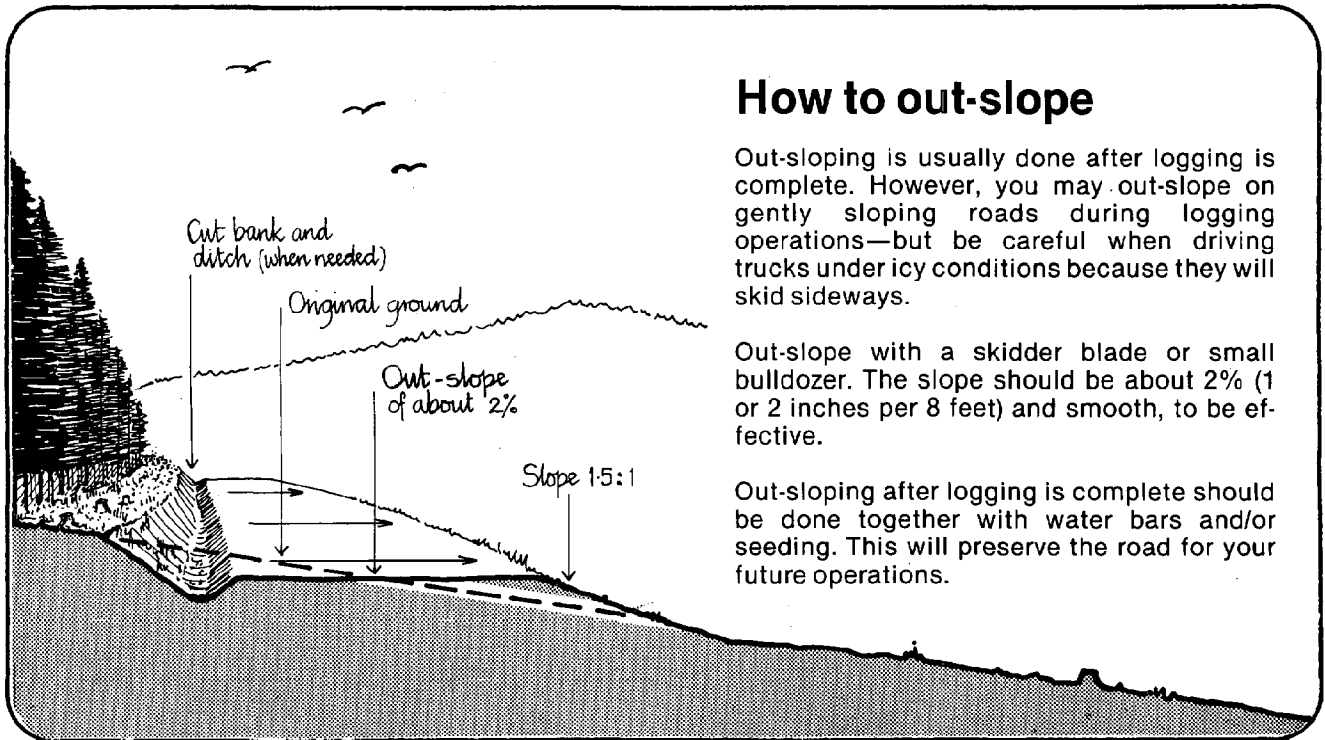


How to out-slope

Out-sloping is usually done after logging is complete. However, you may out-slope on gently sloping roads during logging operations—but be careful when driving trucks under icy conditions because they will skid sideways.

Out-slope with a skidder blade or small bulldozer. The slope should be about 2% (1 or 2 inches per 8 feet) and smooth, to be effective.

Out-sloping after logging is complete should be done together with water bars and/or seeding. This will preserve the road for your future operations.



Slash in skid roads and trails

Slash in skid roads and trails helps reduce erosion

- Slash deposited in skid roads and trails breaks up as the skidder runs over it, packs into the soil, and retards erosion. The slash also keeps the machine out of the mud which means less wear on it. Logs hauled out on slash are cleaner and that means less chain saw wear.
- Where possible drop trees so the limbs and tops end up in the trail “automatically.”
- Softwood slash is best on steep roads and trails—it filters out sediment most efficiently. However, hardwood slash also is valuable in retarding erosion.

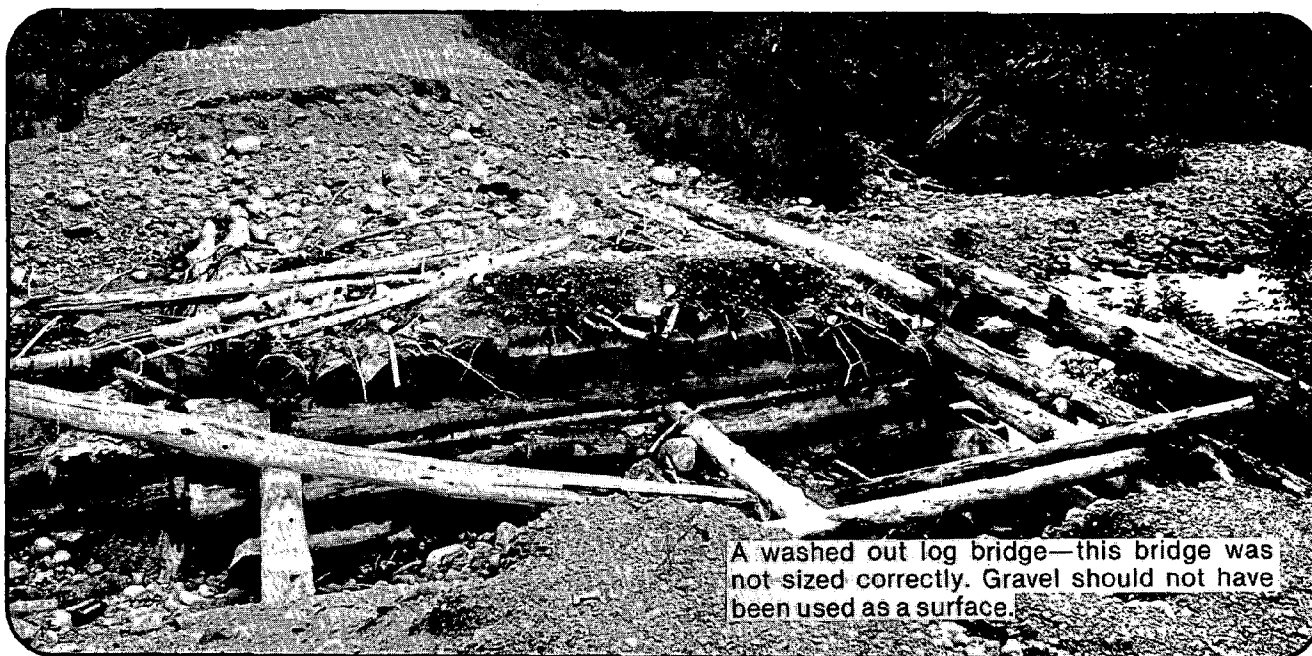


Log bridges

When to use a log bridge

Log bridges make good stream crossings where culverts cannot be used, or when a broad, low span across a stream is needed. However, a bridge can be expensive to construct, so be sure that you have considered other alternatives. Before building a log bridge check to see what regulations might

apply. For example, in the unorganized areas and plantations a bridge or culvert must be installed on land management roads crossing streams that drain more than 50 square miles. For more information see Section 3, page 38 and check with the Land Use Regulation Commission.



How to construct a simple log bridge

1. Select a location where the stream channel is straight and unobstructed. Find stream banks that are firm and level and approaches that are not too steep; the road should cross at right angles to the stream.
2. Estimate the size of the cross-sectional area required to accommodate a 25-year frequency storm by studying the size of the stream channel and evidence of past flooding. Size the bridge according to what this calculation dictates. These cross-section sizes may be reduced if the bridge is to be pulled within 3 years of placement. Allow for debris to flow under the bridge.
3. Excavate the stream banks a little to establish a firm footing for the logs. Excavate to prevent soil from falling into the stream, and do not dig below the high water mark. See the diagram below.

4. Use peeled logs and size the timbers according to the rule-of-thumb dimension in the table below: (Maximum load of 40,000 pounds assumed.)

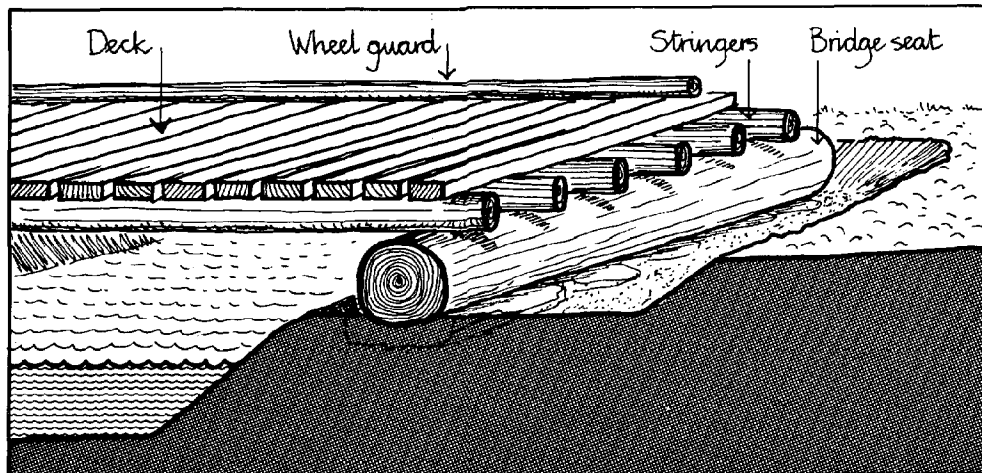
Span	Diameter*
8 feet	12 inches
12 feet	14 inches
16 feet	16 inches

Size of Deck Planks 4" x 12" x 12'.0"

Wheel Guard 10" diameter

* Assume 6 stringers at 24 inch centers.

5. Do not gravel the deck. The gravel holds moisture that will cause the deck to rot.
6. Seed and mulch any disturbed areas outside the road bed so that erosion is minimized.



Seeding

Seeding and mulching helps reduce erosion

Erosion on newly constructed roads or disturbed areas, such as yards or roads that are to be "put to bed" can be held in check by grass and legume seeding and/or mulching. Seeding and mulching on cut and fill areas near streams (within 100 feet) is especially important since erosion there causes excessive sediment build up in streams. Seeding also helps maintain good wildlife habitat.

Photograph below shows seeded logging road. Note the water bar at the base of the steep slope and the small stream bed in the foreground where a culvert has been pulled.

Seed mixtures

The Soil Conservation Service recommends various seed mixtures for seeding skid trails and disturbed areas. Their basic mixture consists of 20 pounds of "Creeping red fescue," per acre. Generally the seed can be broadcast. Fertilizer should be spread at the rate recommended by the manufacturer, the Soil Conservation Service or your Service Forester.

Mulching to prevent erosion before permanent vegetation can take hold also makes sense. Mulch with hay, cereal straw, bark, or native vegetation using about 60 bales per acre.



Logging and the law

Regulations affect woodland owners and woods workers.

The Maine Legislature has enacted a number of laws that affect woodland owners and others who work in the woods. The information below describes the basic intent of some of these laws and regulations, and tells you where you can obtain further information.

Trespass for cutting trees

If more than 10 acres of wood is to be cut on your land, you must mark any property lines within 200 feet of the cut.

Roadside cutting law

Clear cutting is not allowed within 100 feet of the edge of the right-of-way of numbered highways unless approval is given by the Bureau of Forestry. Selective cutting that removes no more than 50% of the volume of trees is permitted.

Slash in streams

Slash from logging operations and other forest product refuse may not be deposited, or allowed to wash into, inland or tidal waters.

Christmas tree cutting and transportation

It is unlawful to cut Christmas trees on someone else's land without written permission from the owner. Persons transporting more than one Christmas tree must be able to show written proof of ownership and must have a Christmas tree registration certificate.



Forest fire prevention laws

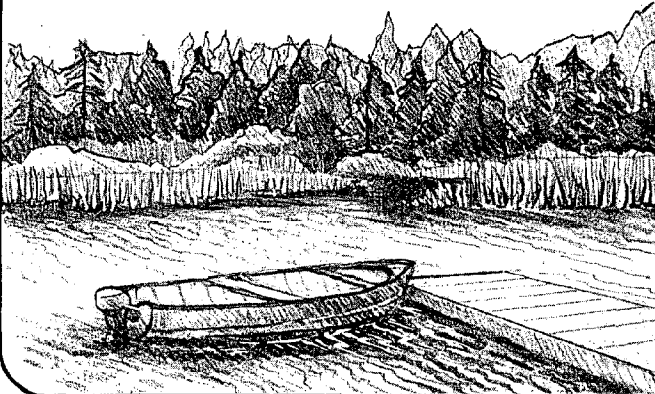
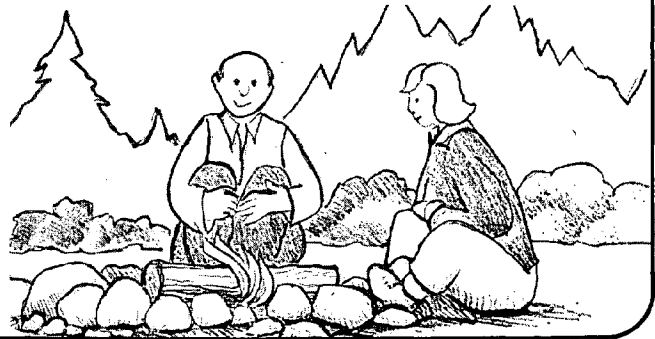
These laws regulate certain fire hazards:

- All equipment operating in forest lands must have an approved spark arrester.
- No burning to clear land is allowed without a permit unless the ground is covered with snow.
- Campfires may not be kindled on forest lands without a permit.
- No slash is to be left within the right-of-way or within 50 feet of the right-of-way of any public highway.
- No slash is to be left within 25 feet of any property line.

For further information

For more information on the above laws contact your local Bureau of Forestry Office or write or call:

Bureau of Forestry
Department of Conservation
State House
Augusta, Maine 04333
Tel: (207) 289-2791.



Shoreland Zoning

All municipalities in Maine have regulations that govern land use within 250 feet of most streams, ponds, lakes, and the ocean. Cutting and logging road construction is regulated in these areas. Cutting, for example, is limited to a percentage of the standing volume of timber. For full details, obtain the Shoreland Zoning Ordinance for the town you are cutting in.

The Land Use Regulation Commission (L.U.R.C.)

L.U.R.C. controls land use in Maine's unorganized townships and plantations. Timber harvesting is regulated in certain areas such as high mountain areas, or land within 250 feet of certain streams, lakes, ponds, and the ocean. In many cases these regulations require that you meet certain standards, and that you notify L.U.R.C. on an official General Notification form before you begin road construction, bridging, or cutting. (See page 26.)

For details of L.U.R.C.'s regulations and standards refer to Section 3 of the Land Use Handbook and get a copy of L.U.R.C.'s "Land Use Districts and Standards" from the Land Use Regulation Commission, State House, Augusta, Maine, 04333. Telephone: (207) 289-2631.

A General Notification is also required if you plan to cut in an area designated by L.U.R.C. and Inland Fisheries and Wildlife as a deer wintering area.

L.U.R.C.'s General Notification procedure

Notify L.U.R.C. if you plan to operate in shoreland or swampy areas

If you plan to harvest timber or construct land management roads and water crossings in certain areas you must notify L.U.R.C., on a General Notification form, and agree to meet certain standards. As soon as you have filed the Notification you may begin work. Generally, a Notification is required if you plan to operate:

- within 250 feet of the high water mark of: ponds over 10 acres in size; the ocean; and streams below that point where they drain more than 50 square miles. These areas are known as P-SL1 and P-GP Subdistricts.
- within 75 feet of: streams that drain less than 50 square miles; wetlands; or ponds of less than 10 acres. These areas are known as P-SL2 Subdistricts.

The performance standards for a General Notification form are briefly explained in Section 3 of this Handbook, (on pages 38 and 40,) and fully explained in L.U.R.C.'s "Land Use Districts and Standards." Both are available from L.U.R.C.



File a General Notification and begin work

L.U.R.C.'s General Notification form requires that you answer 10 questions and provide L.U.R.C. with a map. Information required includes: the names of the land owner and harvesting operator; information about the type of operation, its location, size, and duration; the submission of a location map; and a signed statement which says that you will meet L.U.R.C.'s Standards.

When you obtain the Notification form from L.U.R.C., ask for a copy of the Land Use Guidance Map (zoning map) for the area in which you plan to operate. Use this map to

determine what zones (Subdistricts) you will be operating in since the Notification form requires this information. You may also wish to use the zoning map to show L.U.R.C. the location of your activities.

The General Notification is simple to fill out. Once you have completed, signed and dated it, return it to L.U.R.C., along with the required location map. No fee is required. You may then begin your harvesting, road building, or water-crossing activities.

More Information

The following organizations can provide you with information on educational programs in wood harvesting and forest management.

1. The Bureau of Vocational Education has information on programs in forestry and wood harvesting in secondary schools in the state. For information contact:

The Bureau of Vocational Education
Department of Educational and
Cultural Services
Augusta, Maine 04333
Tel: (207) 289-3367

2. Wood Harvesting Technology is taught at two vocational institutes:

Washington County Vocational
Technical Institute
River Road
Calais, Maine 04619
Tel: (207) 454-2144

Northern Maine Vocational Technical
Institute
33 Edgemont Drive
Presque Isle, Maine 04769

3. The Maine Audubon Society offers a Wood Fuel Program in which firewood specialists will advise land owners on timber management for home firewood use. For information write to:

Wood Fuel Program
Maine Audubon Society
118 U.S. Route #1
Falmouth, Maine 04105
Tel: (207) 781-2330

The following organizations can provide information on good logging practices.

1. Maine Bureau of Forestry
Department of Conservation
State House
Augusta, Maine 04333

To contact your local service Forester or Regional Forester check the telephone directory white pages under Maine, State of, Conservation Department, Forestry Bureau.

2. Maine Forest Products Council
146 State Street
Augusta, Maine 04330
3. The American Forest Institute
New England Regional Office
96 Harlow Street
Bangor, Maine 04401
4. Maine Paper Industry Information
Office
133 State Street
Augusta, Maine 04330
5. American Pulpwood Association
Regional Office
133 State Street
Augusta, Maine 04330
6. Maine Small Woodlot Owners
Association
Mr. Alton Genthner, Secretary
Duck Puddle Road
Waldoboro, Maine 04572

7. The cooperative Extension Service can provide additional information in the areas of Agricultural Economics, Engineering, Entomology, Forest Resources and Plant and Soil Sciences. For information on logging practices write to:
Mr. Timothy G. O'Keefe
Forestry Specialist, Extension Service
School of Forest Resources
University of Maine
Orono, Maine 04473

The following publications provide information on erosion control and other aspects of forest harvest practices.

1. Permanent Logging Roads for Better Woodlot Management, published by the U.S. Department of Agriculture, Forest Service, State and Private Forestry, Northeastern Area, Upper Darby, PA.
2. Woodlands of the Northeast, Erosion and Sediment Control Guides. Prepared by U.S.D.A. Soil Conservation Service, Northeast Technical Service Center, Broomall, Pennsylvania.
3. Erosion Control on Logging Roads in the Appalachians, by James N. Kochenderfer. U.S.D.A. Forest Service research paper NE-158. Available from:

U.S.D.A. Building
Orono, Maine 04473
4. Twelve Ways to Reduce Soil Erosion and Stream Pollution on Logging Jobs. Available from:

New Hampshire Division of Forests and Lands
P.O. Box 856
State House Annex
Concord, New Hampshire 03301
5. Forest Road Location and Erosion Control on Northern New Hampshire Soils, by Paul Wenkelaar. Available from:

Cooperative Extension Service
University of New Hampshire
Durham, New Hampshire
6. Logging Roads—Their Location and Construction, by Emerson Pruett. Northern Logger and Timber Processor, September 1975.
7. Criteria and Procedures for Sediment and Erosion Control for Forest Harvest Operations. Available from:

Maryland Forest Service
Tawes State Office Building
581 Taylor Avenue
Annapolis, Maryland 21401
8. Timber Harvesting Guidelines for New York. Published by the Empire State Forest Products Association.
9. Timber Bridge Design—Summary of Quad Method printed by:
Forest Engineering
Agricultural Engineering Department
School of Forest Resources
University of Maine at Orono
Orono, Maine 04473

Acknowledgements

Author: Brian Kent
Illustrations: Jane Frost
Research & drafting: Robert Scribner
Diagrams: Brian Kent
Book design: Brian Kent and Jane Frost
Typing: Sue Allen
Secretary: Priscilla Daiute

The Handbook was produced with guidance from Nancy Ross, Director of Planning and Program Services, Department of Conservation; Kenneth G. Stratton, Director of the Land Use Regulation Commission; and Richard E. Barringer, Commissioner, Department of Conservation. Many persons in the Department of Conservation, in other State agencies and in public and private organizations assisted by reviewing parts of the Handbook. The Land Use Regulation Commission and staff were particularly helpful with suggestions and technical advice.

We thank them all.

Photograph Credits

Brian Kent
Cover photograph and photos on pages 1, 6, 8, 9, 13, 17.
Michael Mahan
Photographs on pages 3, 4(top left photo), 10, 12, 20, 21, 24.
Frederick Todd
Photograph on page 23.
Maine Bureau of Forestry
Photograph on page 4(bottom right photo).



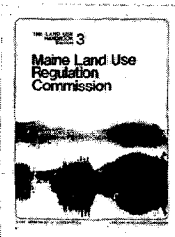
1

Your Land



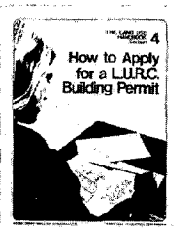
2

Maine Land Use Laws



3

Maine Land Use Regulation Commission



4

How to Apply for a L.U.R.C. Building Permit



5

Design Ideas



6

Erosion Control on Logging Jobs

Accessible en Francais